

In re Patent Application of:  
CROCE ET AL.  
Serial No. 09/839,596  
Filing Date: APRIL 20, 2001

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REMARKS

Applicants again thank the Examiner for the careful and thorough examination of the present application. Claims 5-25 remain pending in the application, with Claims 5-18 being directed to the elected invention. Favorable reconsideration is respectfully requested.

I. The Claimed Invention

A concise explanation of the present invention is included here for the Examiner's convenience. The present invention is directed to a lateral diffused metal oxide semiconductor (LDMOS) integrated device. As recited in independent Claim 5, for example, the LDMOS device includes a semiconductor substrate and a drain region of a first conductivity type adjacent the semiconductor substrate and including a superficial buffer region being more heavily doped than adjacent portions of the drain region. Moreover, the LDMOS device also includes a body region completely surrounded on a bottom and sides thereof by the buffer region and having a second conductivity type, and a source region in the body region and having the first conductivity type. The LDMOS device thus provides a RESURF structure that may be used at relatively high voltages yet with a reduction in punch through problems.

Independent Claim 14 is directed to a related LDMOS integrated device. This claim also recites that the body region is completely surrounded on a bottom and sides thereof by the buffer region as in Claim 5.

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II. The Claims are Patentable

Claims 5-18 were rejected in view of Huang (U.S. 5,665,988) taken alone or in combination with Contiero et al. (U.S. 5,041,895) for the reasons set forth on pages 2-6 of the Office Action. Applicants contend that Claims 5-18 clearly define over the cited references, and in view of the following remarks, favorable reconsideration of the rejections under 35 U.S.C. §102 and §103 is requested.

The Examiner has relied on the IGBT of Huang as including a buffer region 13 completely surrounding a p-type minority carrier injection region 9 (as the claimed body region). The Examiner also refers to "a drain region 2" comprising the buffer region 13 in Huang. Applicants maintain that the Examiner has misinterpreted the cited reference. Referring to Fig. 1 and the associated description in columns 6 and 7 of Huang, layer 2 is more accurately a high resistance surface layer of the substrate 1. The actual drain region 8 of the lateral IGBT does not include the buffer region 13. And, as should be clear to the Examiner, the structures of Huang are not LDMOS structures.

Indeed, the p-type base region 3, which is the body of the intrinsic MOS transistor, is not surrounded by the buffer region 13 at all. The p-type region 3 is underneath the gate electrode 51 in which an inversion layer is induced (see Col. 7, lines 17-21 of Huang). As is appreciated by those skilled in the art, this is the common definition of the body of a MOS transistor.

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As the Examiner is aware, a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. The identical invention must be shown in as complete detail as is contained in the claim.

The cited reference to Contiero et al. does not make up for any of the deficiencies of Huang noted above.

There is simply no teaching or suggestion in the cited references to provide the combination of features as claimed. Accordingly, for at least the reasons given above, Applicants maintain that the cited references do not disclose or fairly suggest the invention as set forth in Claims 5 and 14. Furthermore, no proper modification of the teachings of these references could result in the invention as claimed. Thus, the rejections under 35 U.S.C. §102 and §103 should be withdrawn.

It is submitted that the independent claims are patentable over the prior art. In view of the patentability of the independent claims, it is submitted that their dependent claims, which recite yet further distinguishing features are also patentable over the cited references for at least the reasons set forth above. Accordingly, these dependent claims require no further discussion herein.

### III. Conclusion

In view of the foregoing remarks, it is respectfully submitted that the present application is in condition for allowance. An early notice thereof is earnestly solicited. If, after reviewing this Response, there are any remaining

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informalities which need to be resolved before the application can be passed to issue, the Examiner is invited and respectfully requested to contact the undersigned by telephone in order to resolve such informalities.

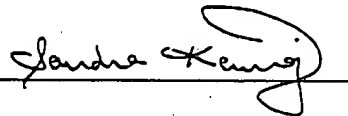
Respectfully submitted,



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CERTIFICATE OF FACSIMILE TRANSMISSION

I HEREBY CERTIFY that the foregoing correspondence has been forwarded via facsimile number 703-308-<sup>7382</sup>~~7722~~ to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 this 30<sup>th</sup> day of October, 2003.



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